

REMARKS

Claims 1-4, 9-30, 35-36, 38-49, 51, 56-57, 64-67, and 69-70 are pending. Claims 5-8, 31-34, 37, 50, 52-55, 59-63, and 68 have been cancelled. Claims 12, 13, 17 and 39 have been amended.

Claims 12 and 13 have been amended, changing ethoxylation to propoxylation. Support for this amendment is found at page 6, lines 6 -8.

Claims 17 and 39 have been amended, changing ".5" to "0.5" for improved clarity.

The Examiner has rejected claims 1-4, 15-18, 26-30, 39, 40, 42-49, 51, 58,64, 66, 67 and 69 under 35 U.S.C. 103(a) as being unpatentable over Theyssen (U.S. Pat. No. 5,935,914) in view of Li (U.S. Pat. No. 6,214,777) and Zeman (U.S. Pat. No. 6,458,343).

Each of the independent claims, 1, 30, 44, 57, and 67, calls for a lubricant comprising at least one ether carboxylate and defoamer or foam destabilizer, wherein the defoamer or foam destabilizer is a C₉ to C₁₁ propoxylated alcohol, and wherein the defoamer or foam destabilizer reduces initial foam and 5-minute foam. None of the cited references specifically teaches a C₉ to C₁₁ propoxylated alcohol.

Li teaches a lubricating composition comprising a quaternary phosphonium compound that may further include a surfactant and states that "[p]articularly suitable nonionic surfactants for use in the lubricant composition of the invention are the alkoxylated (preferably ethoxylated) alcohols having the general formula R₁₀ O((CH₂)_m O)_n wherein R₁₀ is an aliphatic group having from about 8 to about 24 carbon atoms, m is a whole number from 1 to about 5, and n is a number from 1 to about 40 which represents the average number of ethylene oxide groups on the molecule." (Li, column 7, lines 18 – 25) Li therefore teaches an alkoxylated alcohol having 8 to 24 carbon atoms. It fails to specifically teach a propoxylated alcohol having 9 to 11 carbons, as called for in the claims. Li further indicates that an ethoxylated alcohol is preferred, whereas the present application calls for a propoxylated alcohol. Like Li, neither Theyssen nor Zeman

specifically disclose a C₉ to C₁₁ propoxylated alcohol. Therefore none of the cited references specifically disclose a C₉ to C₁₁ propoxylated alcohol.

The use of a C₉ to C₁₁ propoxylated alcohol in the lubricant as claimed results in unexpected decrease in initial foam and 5 minute foam. As shown in Table 9 (page 22, full page) and Table 10 (page 23, lines 5 – 9), the lubricant composition of Example 1 which included Degressol® SD 20, a C₉ to C₁₁ propoxylated alcohol, exhibited superior performance for both initial foam and 5-minute foam. In comparison, the defoaming action of comparative Example L, which included Triton® EF-19, a C8 to C10 ethoxylated and propoxylated alcohol, was not as effective.

The results of the comparative testing are unexpected, because propoxylated alcohols have not typically been used in lubricants because they are more difficult to keep in solution. The alkyl chain length affects the solubility in water, and surfactants with propoxyl groups are less water soluble than surfactants with ethoxyl groups. Although lower water solubility is a key factor to defoaming, propoxylated alcohols have not typically been used because they are harder to keep in solution. However, applicants have discovered that by using a propoxylated alcohol with a chain length of C₉ to C₁₁, they can obtain adequate water solubility as well as good defoaming properties. As stated in the first Affidavit of the inventor, Richard O Ruhr, the functions of the additional components in the composition would have no effect on the foam destabilizing properties of the compositions. The foam destabilizing performance of the composition of Example 1 compared to Example L highlights the criticality of utilizing a C₉ to C₁₁ propoxylated alcohol to reduce initial foam and 5-minute foam.

Although Example 1 utilizes a specific oleyl ether carboxylate, the invention is not limited to oleyl ether carboxylates. The defoaming effect is provided by the C₉ to C₁₁ propoxylated alcohol, which would act to reduce foaming in any ether carboxylate. Ether carboxylates form bubble structures, and the C₉ to C₁₁ propoxylated alcohol inserts into this

structure and disrupts it, thereby reducing foaming. This activity of the C₉ to C₁₁ propoxylated alcohol would occur in ether carboxylates generally, and not just in oleyl ether carboxylates. It is the C₉ to C₁₁ propoxylated alcohol which is critical to the defoaming activity, and not the choice of the ether carboxylate.

As explained in the second Affidavit of Richard Ruhr, submitted with this response, the C₈ to C₁₀ alkoxylated alcohol of Example L, Triton® EF-19, is not a C₉ to C₁₁ propoxylated alcohol as called for in claims 1-4, 15-18, 26-30, 39, 40, 42-49, 51, 57, 58, 64, 66, 67, and 69. Rather, Triton EF-19 is a C₈ – C₁₀ ethoxylated propoxylated alcohol. As such, each molecule of Triton EF®-19 includes repeating units of both ethoxyl and propoxyl groups together. In contrast, the claim calls for a C₉ to C₁₁ propoxylated alcohol, which is an alcohol having only repeating propoxyl groups.

Dependent claims 2-4, 15-18, 26-29, 39, 40, 42, 43, 45-49, 51, 58, 64, 66, and 69 depend from the independent claims 1, 30, 44, 57, and 67 described above and therefore they also are also not obvious.

The Examiner has rejected claims 19-24, 41, 56, 65 and 70 under 35 U.S.C. 103(a) as being unpatentable over Theyssen (U.S. Pat. No. 5,935,914) in view of Li (U.S. Pat. No. 6,214,777) and Zeman (U.S. Pat. No. 6,458,343) and further in view of Person Hei (U.S. Pat. No. 5,723,418). Applicants above arguments above regarding the deficiencies of each reference and their combination are equally applicable here. The cited references do not specifically teach a lubricant comprising a C₉ to C₁₁ propoxylated alcohol. The use of a C₉ to C₁₁ propoxylated alcohol produces unexpected results. Therefore the claims are not obvious over the cited art.

The Examiner has rejected claim 25 under 35 U.S.C. 103(a) as being unpatentable over Theyssen (U.S. Pat. No. 5,935,914) in view of Li (U.S. Pat. No. 6,214,777), Zeman (U.S. Pat. No. 6,458,343) and Person Hei (U.S. Pat. No. 5,723,418) and further in view of Login (U.S. Pat. No. 4,395,373). Again, Applicants above arguments above regarding the deficiencies of each

reference and their combination are equally applicable here. The cited references do not specifically teach a lubricant comprising a C₉ to C₁₁ propoxylated alcohol. The use of a C₉ to C₁₁ propoxylated alcohol produces unexpected results. Therefore the claims are not obvious over the cited art.

The Examiner has rejected claims 9-13, 35, 36, and 38 under 35 U.S.C. 103(a) as being unpatentable over Theyssen in view of Li and Zeman and further in view of Gerke (U.S. Pat. Pub. No. 2004/0072704). Again, Applicants above arguments regarding the deficiencies of each reference and their combination are equally applicable here. The cited references do not specifically teach a lubricant comprising a C₉ to C₁₁ propoxylated alcohol. The use of a C₉ to C₁₁ propoxylated alcohol produces unexpected results.

The Examiner has rejected claim 14 under 35 U.S.C. 103(a) as being unpatentable over Theyssen in view of Li and Zeman (U.S. Pat. No. 6,458,343) and Person Hei (U.S. Pat. No. 5,723,418) and further in view of Behler (U.S. Pat. No. 4,894,485). Again, Applicants above arguments regarding the deficiencies of each reference and their combination are equally applicable here. The cited references do not specifically teach a lubricant comprising a C₉ to C₁₁ propoxylated alcohol. The use of a C₉ to C₁₁ propoxylated alcohol produces unexpected results.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,

/Mia E. Mendoza/

Mia E. Mendoza
Registration No. 56,688

Customer No. 22859
Fredrikson & Byron, P.A.
200 South Sixth Street, Suite 4000
Minneapolis, MN 55402-1425 USA
Telephone: (612) 492-7000
Facsimile: (612) 492-7077

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